Remarks

The Examiner rejected claims 1, 2, 9, 10, 13, 18 and 19 under section 103(a) as being unpatentable over Dai (6922890) in view of Saenger (4576902) and Barford (4460490). Claims 1 and 13 are the independent claims.

The Examiner asserted that Dai substantially teaches the method of the claimed invention, including positioning sliders on an adhesive surface, placing a protective film on the slider, binding the slider in a matrix, performing an air-bearing patterning step, and removing the protective film and matrix material via solvent application (NMP) (Figures 4-7 and Columns 6 and 7). The applicants respectfully disagree.

Dai's abstract includes the following:

> Structures are placed with working surfaces facing down onto an adhesive layer such that structures remain fixed during heating. A bi-layer encapsulating film is used to achieve planarization. A carrier is bi-laminated with a thermoplastic film layer followed by a chemically inert protective polymer film layer that can withstand etch and cleaning processes. The thermoplastic layer is laminated on top of the carrier; the polymer layer is laminated on top of the joined thermoplastic layer and carrier. The carrier with bi-layer film is then placed onto the backside of the structures to resist chemical attack from the front side during photostrip and enable planarization. When heat is applied, the bi-layer encapsulating film melts and pushes the polymer layer into the gaps between structures thereby achieving complete planarization.

Thus, Dai teaches a process in which a carrier is prepared with a thermoplastic film 14 followed by polymer film 16. The carrier with these solid films is then placed on top of the array of sliders and heated to melt the films. The melted thermoplastic film 14 acts to force the polymer film 16 down between the sliders. (Col. 6, lines 45-48). It is the polymer film 16 that is in contact with the sliders. (See figure 6, for example). The conductive thermoplastic film 14 is said to be preferably Able Stick Conductive Thermal Plastic Film, or Able Stick ESD (Electrostatic discharge), approximately 200 μm thick. Polymer film 16 is said to

be preferably polyethylene, approximately 75 μm thick. (Col. 6, lines 12-15). Therefore, as the Examiner noted, Dai does not teach applying a liquid solution of any kind to the sliders and specifically does not teach the application of a liquid solution of polyvinyl alcohol to the sliders as applicants claim.

In addition, applicants would add that Dai fails to teach the use of two solvents as applicants claim. Independent claims 1 and 13 recite the use of two solvents with the second solvent being used to soften the polyvinyl alcohol film to release the sliders from the matrix. Neither Dai nor any of the cited references teach this part of the claimed invention.

However, the Examiner noted that the Dai reference teaches that the protective film is formed of a material such as polyethylene (col. 6, lines 40-50 and col. 7, lines 25-27). The Examiner argued that one of ordinary skill in the art at the time of the invention would have found it obvious to form the protective layer of Dai from polyvinyl alcohol since such a material is commonly used to form protective films and more particularly, such a material is recognized as being used as an equivalent alternative to polyethylene films, as shown for example by Saenger (Column 3, Lines 34-60). The Examiner argued that such a disclosure suggests that polyvinyl alcohol provides suitable protective characteristics and is sufficiently inert, as compared to polyethylene.

The applicants respectfully disagree with the Examiner's interpretation and use of the Saenger reference. Saenger (4576902) cannot reasonably be combined with Dai since Saenger is non-analogous art. Saenger does not relate to the subject of slider processing, but is instead teaching about "positive working photosensitive film resist material suitable for multiple image-wise exposure." (See abstract). Therefore, Saenger's statements must be taken completely out of context to be applied to Dai. Saenger's comments about polyethylene and polyvinyl alcohol being alternatives applies only in the context of photosensitive film resist materials:

> To facilitate storage and further processing, a protective film is applied; polyethylene and polypropylene films are particularly suitable for this purpose. Of course, it is also possible to cast films from solution onto the resist coating, for

example to apply a coating of polyvinyl alcohol from aqueous solution. (Col. 3, lines 45-50).

Therefore, one of ordinary skill in the art of slider processing would not look to Saenger for a teaching of alternative materials to be applied to Dai's process. Reading Saenger gives no information on whether polyethylene and polyvinyl alcohol would be interchangeable in Dai's process. Dai's process requires that heat be applied above the melting temperature of the polymer film, but within the temperature limitations of the sliders. At these temperatures (typically 120 degrees C.) he says the thermoplastic film layer 14 melts and flows, while the other layer 16 remains chemically inert. When the thermoplastic film 14 melts, it pushes down the chemically inert, polymer film 16 to flow into and fill the gaps 26 between the sliders 18. (Col. 6, lines 39-44). There is no teaching in any of the cited references of how polyvinyl alcohol would react under these processing conditions. However, information about polyvinyl alcohol supplied by Dow Chemical suggests that polyvinyl alcohol has a melting point greater than 150 degrees C) which is much higher than the 120 degrees C cited in Dai. (See http://www.dcchem.co.kr/english/product/p_petr/p_petr8.htm).

Moreover, even if polyvinyl alcohol were substituted for polyethylene in Dai's process, the presently claimed invention does not result. Since Dai builds a two layer solid film in the carrier prior to applying the carrier to sliders, simply substituting polyvinyl alcohol for polyethylene does not yield the claimed invention in which the liquid polyvinyl alcohol is applied directly to the sliders.

Barford (col. 8, lines 30-45) is applied by the Examiner to show the known use of polyvinyl alcohol films or aqueous solutions of polyvinyl alcohol to form protective films. However, Barford is also non-analogous art since it relates to lavatory cleansing blocks for immersion in the cistern of a lavatory. (See abstract). One of ordinary skill in the art of slider processing would not look to teachings on lavatory cleansing blocks to learn about alternative materials for slider processing. Barford teaches that the lavatory bleaching tablet is provided with a protective film coating such as polyvinyl alcohol, but that teaching cannot reasonably be applied to sliders.

The other dependent claims 3-8, 12, 14-17 and 21 were rejected under 35 U.S.C. 103(a) as being unpatentable over Dai, Saenger, and Barford as applied in claim 1 above and further in view of the Admitted Prior Art (Page 1, Lines 25-35), Minemoto (JP57090061), and/or Krezanoski (3911107). These additional references do not cure the omissions described above, so the independent claims 1 and 13 likewise distinguish over any combinations of these references as well.

Conclusions

It is respectfully submitted that the cited references taken singly or together do not teach the applicants' invention as claimed. Moreover, the Saenger, and Barford references are non-analogous art and cannot reasonably be combined with Dai under section 103(a). Therefore, the applicants believe that all of the claims in the application are allowable.

Respectfully submitted,

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